U.S. COMPUTER VENDOR
CUSTOMER SERVICE PROFITABILITY

A Custom Study by INPUT
for National Advanced Systems

Performed for: Mr. Jon W. Dachy
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TITLE U.S. COMPUTER VENDOR CUSTOMER SERVICE PROFITABILITY

DATE LOANED	BORROWER'S NAME

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I INTRODUCTION

- This custom study was initiated by Jon W. Dachy, Director, International of National Advanced Systems. INPUT agreed to use its best efforts to gather relevant data from its files and analyze it within the budgeted time specified by Mr. Dachy.

- The object of the study was to determine the profitability and cost structure of computer vendor customer service organizations in the U.S.

- The sources of information were INPUT library files and vendor interviews made in 1983 and 1983. Of the 48 1983 interviews available, 9 were chosen to be analyzed in depth because of the comparability in size and activity of the interviewees with National Advanced Systems.

- The format of this report follows precisely the layout of the notes attached to Jon Dachey's letter of January 31, 1984. INPUT has exercised its best efforts in completing this data, allowing for the proprietary nature of the data analyzed and for the enormous disparity in methodology used by customer services organizations in definition of costs, inclusions/exclusions, organizational structures, stage of maturity, and geographic coverage.

- National Advanced Systems may, for a period of 30 days starting from the receipt of this report, consult with INPUT at no extra cost on the contents of this report.

II ORGANIZATIONAL STRUCTURE

- Seventy-one percent of the large system vendors interviewed in 1983 have integration system software support into hardware support - although looking at organization charts does not clearly indicate that commitment (see CDC customer services organization chart, Exhibit II-1).

- Looking deeper into, say, Honeywell's marketing section of the customer services division (Exhibit II-2) reveals only (i) QA split by type of system (ii) the service center implementation group (where the integrated support is actually provided).

- There is no doubt, however, that hardware support services and software support services should be integrated into one (service center) responsibility and include first line support for fault calls on all customer services requirements, i.e.:

  - Consulting requirements (hardware and software).

  - Core system support (i.e., total support of the subsystem or subsystems critical to users data processing needs, irrespective of vendor origin).

  - Training and documentation queries and needs.

  - Configuration planning and installation planning.

  - Supplies ordering.

EXHIBIT II-1

CDC Customer Services Organization

1984 ORGANIZATIONAL CHART

Engineering Services
G W Gilbert
Vice President

Special Programs
B P Rothmann
Executive Consultant

Legal Counsel
J I Johnson
Staff Attorney

Organizational Effectiveness
R H Matson
Senior Consultant

Customer Support
G L Sjogren
Manager

Syntonic Technology
O N Lapp
President

Maintenance and Services Planning
L W Schulze
General Manager

ES Education
R J Weias
General Manger

U S Operations
H D DeVries
Vice President

Financial Plans and Controls and Administration
K J Muehleck
General Manager

Logistics Operations
S A Muscanto
General Manager

Product Line Management
R G Barrett
General Manager

International Operations
R J Thomas
Vice President

Personnel and Administration
W D Seiler
General Manager

Marketing
R G Crowder
General Manager

Central Hardware/Software Support
A A Walecka
General Manager

U. S. Operations
B W Zimmermen
Manager

ES Computer Systems Product Management
J P LeKang
Director

DS/Peripheral Systems/TPM
P E Gray
Manager

Quality/Technical Programs
G O Viator
Manager

Technical Courseware Development
C J Klein
Manager

Support Services
R C Moore
Manager

Education Delivery
D L Decker
Manager

International Education
R E Peyne
Manager

Quality, Productivity and Standards
P G Thompson
Manager

Western Region
W C Perkins
General Manager

Central Region
R D DeGrole
General Manager

Eastern Region
O K Welter
General Manager

Operations Planning
R L Young
Manager

Field Operations
T E Duca
Manager

Systems Architecture
C R Burnell
General Manager

WDC Financial Plans and Controls
D J Dolan
Director

ES Headquarters Accounting
J J Gillen
Manager

Pricing Administration
R Eglitis
Manager

Administration
J W Hearl
Manager

Information Systems
T H Peterson
Manager

Repair/Refurbishment
R A Noller
Director

U S Area Logistics
D O Young
Manager

International Area Logistics
L M Sappanos
Manager

Material Control
G A Lundquist
Manager

WDC Operations
H Echols
Manager

OEM/Commercial Logistics
T J Rechtiene
Manager

Program Management
L N Hansen
Manager

Quality
M F Poskozim
Manager

Consultant
P M Bruening

P^2/COMMA/OEM/3P/CS
G M Poltatz
Director

Microcomputers/ Commercial Spares
J A Naher
Director

Data Systems/Internet Business
L R Eyler
Director

Facility Planning and Consulting
O L Clark
Director

Strategic Planning and Administration
G F Remsburg
Manager

Business Development/ Acquisitions
V J Bruesehoff
Manager

International Liaison
L L Soine
Manager

West and Central Europe Operations
E L McCrory
General Manager

North Europe Operations
E L McCrory (Acting)
General Manager

Pan Am/Pacific Operations
A M Simmons
Director

Quality/Technical Liaison
H Wimmer
Manager

Developing Countries
W C Parker
Manager

Headquarters/Field Operations
M S Patnaude
Manager

World Distribution Center
L B Weibye
Manager

Productivity/Office Services
D R Andreesen
Manager

Employee Communications
R H Matson
Senior Consultant

Data Systems
T H Middlekauff
Marketing Manager
OEM/TPM

International
D E Olson
Marketing Manager

COMMA/P^2
R L Danielson
Marketing Manager

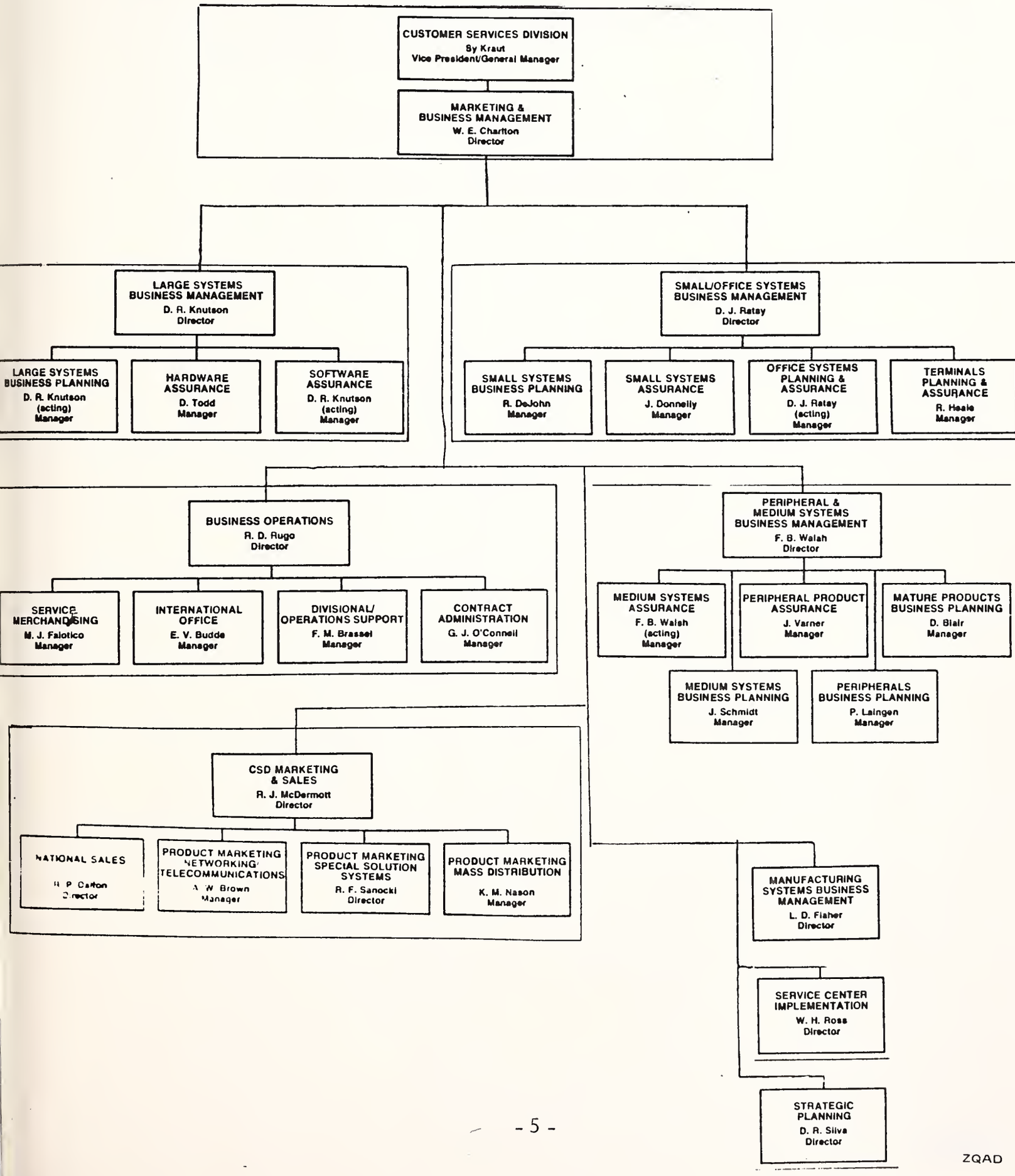
Marketing Administration
R A Kidd
Manager

Central Software Support
M A Morandi
Director

Central Hardware Technical Support
R E Floegel
Manager

EXHIBIT II-2

Honeywell
Customer Services Division,
Marketing & Business Management Section



ZQAD

- Concentration of specialist manpower covering these areas in one location has had a demonstrable productivity gain on large system vendors and a gain in customer satisfaction:

  - Two percent drop in labor costs.

  - Several points gain in user satisfaction levels.

III P & L RESULTS IN CUSTOMER SERVICE ORGANIZATIONS

A. INTRODUCTION

- Out of 48 customer service organizations interviewed in 1983, 90% operate on a P/L basis and 10% as cost centers. Caution must be used in interpreting these numbers, however:

  - P/L delegation is not uniform; some organizations operate P/L control at HQ only, some delegate control all the way down to district offices. In general, the longer the installed base the lower this delegation is pushed in the organization pyramid.

  - "P/L" means different things to different people and is not a strict financial term; for example P/L control at the district office level usually means gross margin (i.e., revenue minus direct costs), sometimes net margin (i.e., gross margin minus sales, marketing, and benefit costs), and rarely net profit (net margin minus allocations). It can be argued that it is only meaningful to delegate that which the different levels of the service organization can control, excluding, for example, allocations.

  - Cost centers are not obsolete; it makes sense to operate new branches, districts, or even new country service organizations initially as cost centers, where the emphasis is on setting up a responsive organization

rather than on nickels and dimes. When the revenue base has exceeded, say, dollars million annual, then P/L controls can be added.

B. PROFIT/LOSS RANGES

- Of the customer services organizations interviewed in 1983, 60% operated at a profit (before tax) ranging from 3% of revenues to 35% with the median value at 21%. Losses ranged from 8% to 28% of revenues. It is difficult to draw conclusions as to what factors are prevalent in determining profitability but the following are service elements that profitable large system customer service organizations have in common:

  - Revenue per head: a minimum of $120,000 per in field engineer seems to be the point at which large system customer service organizations make money. This equates to approximately $4,000,000 (if sold value) or equipment maintained by each engineer.

  - Engineers per first level manager: the norm among profitable large systems vendors seems to be 11:

    . IBM: 8-10 average of 8.5.

    . CDC: 10-16 average of 12.

    . Burroughs: 12.

    . Honeywell: 8-10 average of 9.

- This targets a minimized overhead.

- Automation: of activity reporting, inventory control, MTTR, MTBF and other performance data.

- Integration of systems software support with hardware support: all appear to have at least partially accomplished this integration; (note that this usually means that the customer sees a single source of support and that systems software staff are a part of the customer services organization).

- Elements that are not yet found (but which INPUT recommends) include:

  - Site management responsibility (for the FE).

  - Increased software maintenance pricing (to 20% of purchase price).

  - Single source maintenance contracts.

- Exhibit III-1 shows the change in large system customer services financials from 1982 to 1983.

EXHIBIT III-1

LARGE-SCALE SYSTEMS

ANNUAL FIELD SERVICE FINANCIAL DATA

	1982	1983	PERCENT CHANGE
Gross Margin (Percent)	28.7%	31.0%	+2.3%
Profit Before Tax (Percent)	19.6	20.9	+1.3
Revenue/Engineer ($ Thousands)	$113	$120	+6.2
Expense/Engineer ($ Thousands)	$ 81	$ 86	+6.2
Margin/Engineer ($ Thousands)	$ 32	$ 34	+6.3
Engineers/Total Field Service Staff (Percent)	67.0	66.0	-1.0

SOURCE: Average of responding vendors

SOURCE: INPUT Large Systems Vendor Competitive Analysis

IV EXPENSE BREAKDOWNS

- An initial sample of expense breakdowns by nine customer service organizations is shown in Exhibits IV-1, IV-2, and IV-3. The following is a more detailed analysis of each of the expense categories commonly found in customer service organizations.

A. LABOR

1. DIRECT LABOR

- Direct labor ranges from 23% to 40% of expenses depending on whether the customer services organization has responsibility for software support or not, if support centers are used and if remote diagnostics are offered.

- As a guideline: count 25% of expenses for H/W maintenance labor, add 10% for software support, subtract 2% if software support centers are heavily used and add 3% for remote diagnostics (contrary to popular belief, RD does not save labor).

2. BENEFITS

- The average is 10% of expenses and includes medical, pension, and cars.

EXHIBIT IV-1

DETAIL OF FIELD SERVICE VENDORS' EXPENSES AND REVENUE

EXPENSE (1983 Unless Marked Otherwise)	A	B	C	D	E	F	G	H	I
	Percent of Expenses								
Direct Labor	34%	23%	28%	-	31%	40%	25%	24%	34%
Support Personnel	4	5	2	-	0	-	-	-	-
Management and Administration	11	3	14	-	9	10	12	-	11
Benefits	-	2	8	-	10	10	8	-	9
Subtotal	49%	33%	52%	57%	50%	60%	45%	24%	54%
Parts	-	14%	23%	7%	33%	30%	-	21%	5%
Depreciation	15	4	1	5	2	-	4	-	6
Travel	8	8	8	4	6	4	10	11	7
Education	-	1	2	-	2	4	1	-	-
Overhead	1	6	6	12	5	-	-	-	6
Logistics	-	1	5	-	-	-	-	-	-
Corporate Allocations	14	12	7	10	-	-	6	-	10
Miscellaneous	13	-	-	5	-	-	18	44	12

EXHIBIT IV-2

RANGE AND AVERAGE OF LABOR EXPENSES IN
LARGE-SYSTEM FIELD SERVICE ORGANIZATIONS

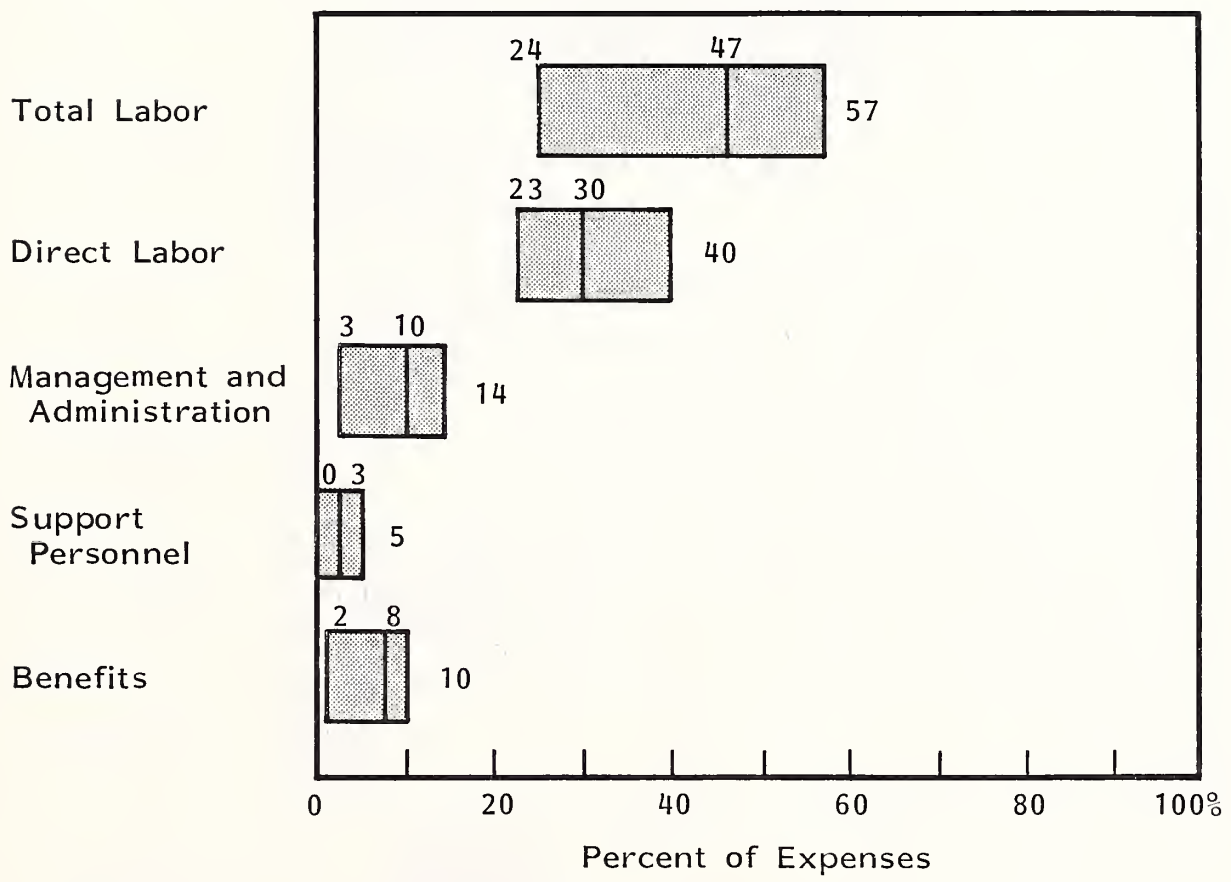
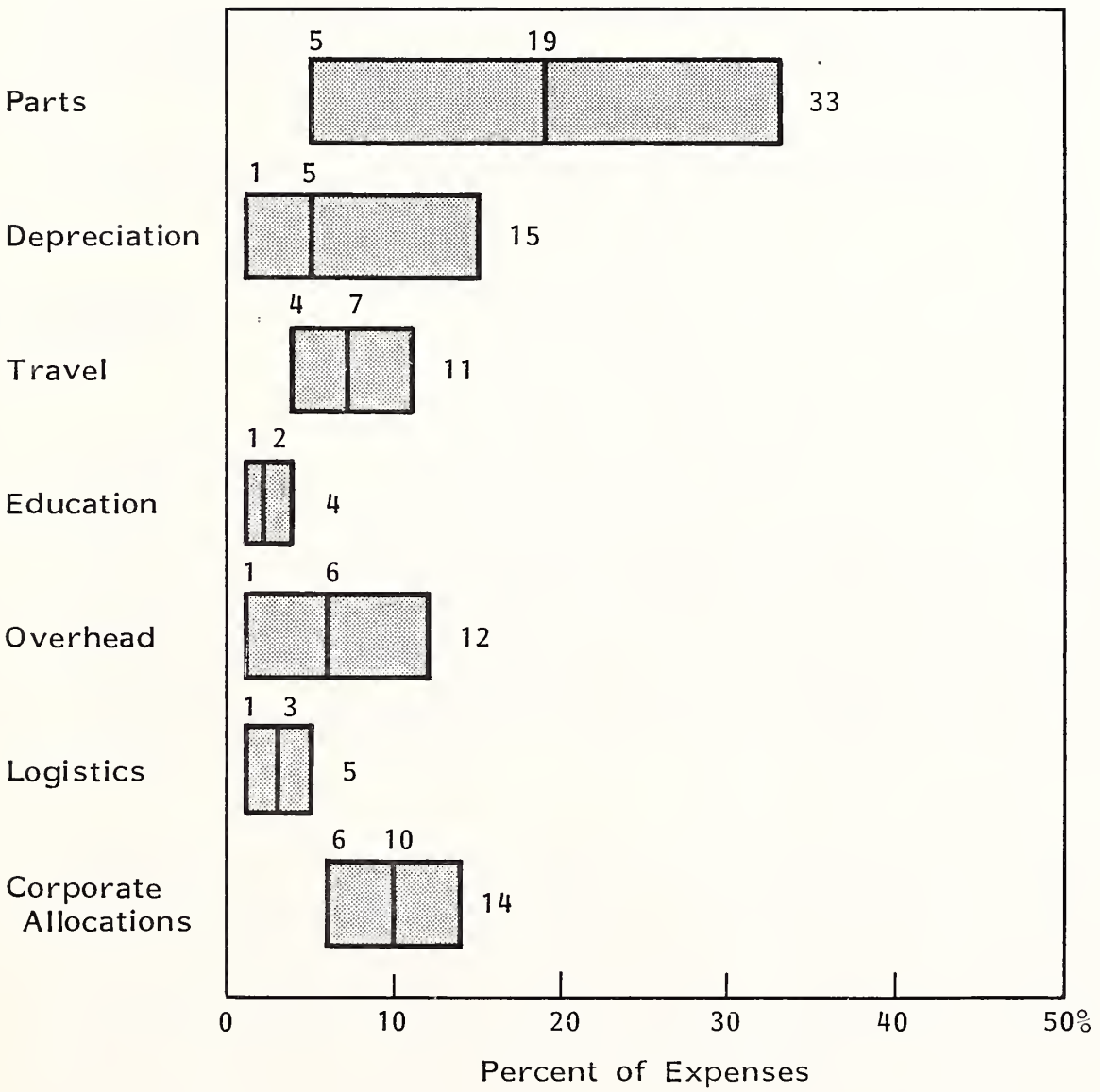


EXHIBIT IV-3

RANGE AND AVERAGE OF NON-LABOR COSTS IN LARGE-SYSTEM FIELD SERVICE ORGANIZATIONS



3. EDUCATION

- The average is 2% of expenses, evenly divided between in-house training and external (customer training).

4. MANAGEMENT/SUPERVISION

- The average expenditure is 9% of expenses. Each country market supports this burden with minor variations and includes all levels of supervision.

- No breakdowns are available for local and corporate overheads.

B. PARTS

1. SPARES USAGE

- This is extremely hard to value as a percentage of expenses (to which it is not proportional) but is usually 3% of the value of the installed base. For a company of the $100 million customer services revenue level, profitable at the 15% level, spares usage should (at burdened manufacturing cost) run at 15% of expenses.

- Depreciation is usually over the useful life of the class of part in question and is not a simple five or seven year straight line calculation. For example, stocks of parts that become obsolete overnight (because of faults found or a marketing decision stemming form product/model obsolescence) are immediately written off. Depreciation is usually around 3% of expenses. Consistency is more important to auditors that justification of the method adapted, so that changes in current practices are very difficult.

C. CORPORATE OVERHEADS

- Logistics support is usually treated as an overhead and runs at 3% of expenses.
- Corporate overhead (allocations) average 12% of expenses.

D. TRAVEL AND OTHER

- Usually average 8% of expenses.
- The average expense profile that results from the above is shown in Exhibit IV-4.

E. EXCLUSIONS (INTERNAL TRANSFERS)

- Several items and responsibilities of field service organizations entitle them to receive reimbursement from internal groups. Amont them are:
  - Warranties.
  - Field change orders (FEOs)/engineering change orders (ECOs).
  - Sales credits.
  - Internal field service.
- Many managers feel that the administrative overhead to deal with these transfers is not worth the time and effort expended. But the fact remains

EXHIBIT IV-4

CUSTOMER SERVICES ORGANIZATION
AVERAGE EXPENSE PROFILE

ITEM	1983 PERCENT
• Labor	38%
. Direct, hardware	25%
. Direct, software	10
. Remote diagnostics	3
• Management/Supervision	9
• Benefits	10
• Education	2
• Parts	18
. Usage	15
. Inventory depreciation	3
• Overheads	15
. Logistics	3
. Corporate allocations	12
• Travel and Other	8

that these expenses must be tracked and the question is which method is the most effective.

- In the case of high-volume products, internal transfer costs can become staggering. An example is field change orders (FCO): one FCO costing $150 on an installed base of 2,000 systems gives rise to an internal transfer of $300 million, and many service organizations routinely handle 10-20 such orders.

- Of course, most companies set up a selective engineering change program, but the same level of costs are involved there also. If a company wants to measure accurately the financial performance of field service, internal transfers are a necessity.

- Many vendors are using incident reports to generate internal transfer requests. This appears to be the most effective method of recovering real costs.

APPENDIX: DETAILS OF VENDOR EXPENSES

- On the left hand side of each sheet is the vendor identification letter.

COMPANY A

EXPENSE LINE ITEM	PERCENT OF TOTAL EXPENSES [use ( ) to indicate credit] 1982	1983	1984
a) Basic direct labor, wages, salaries	38.0	34.5%	35.0%
b) Direct labor overtime shift premiums and standby pay			
c) Support personnel salaries	5.9%	3.8%	4.0%
d) Management and administrative salaries and premiums	12.6%	10.6%	10.5%
e) Benefits programs			
f) Net parts usage			
g) Inventory variances			
h) Depreciation	13.8%	14.6%	14.0%
i) Travel (includes auto leases)	8.4%	8.3%	8.3%
j) Relocation			
k) Education			
l) Equipment rental/lease			
m) Office, warehouse space			
n) Communications	2.2%	1.2%	1.2%
o) Interdivisional transfers			
p) Logistics, repair depot, and other expenses not reported above			
q) Corporate general and administrative allocation (overhead)	4.0%	13.7%	13.7%
r) Other significant categories			
MISC.	15.1%	13.3%	13.3%

FINANCIAL PERFORMANCE	FISCAL YEAR END 1982	1983	1984	1987
a) Field service revenue ($ millions)	54.6	55.2	54.0	N/A
b) Field service expenses ($ millions)	48.4	53.5	53.0	N/A
c) Pretax profit (percent)	6.2	1.7	1.0	N/A
d) Revenue per field service engineer (direct labor)	514 .106	520 .106	520 .104	N/A
e) Direct expense per field service engineer (direct labor)	.046	.036	N/A	N/A
f) Fully burdened expense per field service engineer (direct labor)	.094	.103	.102	N/A
g) Basic hourly rate charged for service	$60	$75	$75	N/A
h) Fully burdened field service expense per field service employee (all categories)	855 .057	805 .066	805 .066	N/A

COMPANY B

EXPENSE LINE ITEM	PERCENT OF TOTAL EXPENSES [use ( ) to indicate credit] 1982	1983	1984
a) Basic direct labor, wages, salaries	19.2%	20.8	30.9
b) Direct labor overtime shift premiums and standby pay	1.9%	2%	3.7
c) Support personnel salaries	3.9%	5%	6%
d) Management and administrative salaries and premiums	2.5%	3%	3.5%
e) Benefits programs	1.5%	1.6%	1.7%
f) Net parts usage	19.1	14.9%	15.9%
g) Inventory variances			
h) Depreciation	2.5%	3.6%	3.2%
i) Travel (includes auto leases)	3.2%	7.0%	7.5%
j) Relocation	.6%	1.0%	1.2%
k) Education	.7%	1.1%	1.3%
l) Equipment rental/lease	-	-	
m) Office, warehouse space	2.6%	2.8%	2.7%
n) Communications	3.5%	3.6%	3.7%
o) Interdivisional transfers	-	-	
p) Logistics, repair depot, and other expenses not reported above	1.5%	1%	1.5%
q) Corporate general and administrative allocation (overhead)	12.9%	12%	12.9%
r) Other significant categories			

FINANCIAL PERFORMANCE	FISCAL YEAR END 9-30 1982	1983	1984	1987
a) Field service revenue ($ millions)	17.7 mil	24.3 m	29 m	50 m
b) Field service expenses ($ millions)	14.3 m	18.8 m		
c) Pretax profit (percent)	18.9	22.5		
d) Revenue per field service engineer (direct labor)				
e) Direct expense per field service engineer (direct labor)	22,725 est			
f) Fully burdened expense per field service engineer (direct labor)				
g) Basic hourly rate charged for service				
h) Fully burdened field service expense per field service employee (all categories)	32,747 est			

COMPANY C

EXPENSE LINE ITEM	PERCENT OF TOTAL EXPENSES [use ( ) to indicate credit] FY82 APR-81/MAR-82	FY83 4/82-3/83	FY84 4/83-3/84
a) Basic direct labor, wages, salaries	26.0	24.5	25.5
b) Direct labor overtime shift premiums and standby pay	4.5	3.6	3.6
c) Support personnel salaries	2.0	2.0	2.2
d) Management and administrative salaries and premiums	13.8	13.9	13.7
e) Benefits programs	6.8	7.7	9.2
f) Net parts usage	15.0	23.4	17.8
g) Inventory variances	1.7	(2.4)	—
h) Depreciation	0.7	0.7	0.8
i) Travel (includes auto leases)	9.5	7.7	7.3
j) Relocation	0.5	0.5	0.3
k) Education	2.4	2.1	3.6
l) Equipment rental/lease	0.3	0.3	0.5
m) Office, warehouse space	1.2	1.3	1.3
n) Communications	4.4	4.0	4.1
o) Interdivisional transfers	(0.7)	(1.5)	(0.9)
p) Logistics, repair depot, and other expenses not reported above	1.5	1.5	0.4
q) Corporate general and administrative allocation (overhead)	6.1	6.7	6.4
r) Other significant categories			
SUPPLIES	0.9	1.0	0.8
FREIGHT	3.4	3.0	3.0

FINANCIAL PERFORMANCE	FISCAL YEAR END MARCH 31 FY 1982	FY 1983	FY 1984	FY 1987
a) Field service revenue ($ millions)	35	41	48	50
b) Field service expenses ($ millions)	39	44	46	45
c) Pretax profit (percent)	(12)	(7)	4	12
d) Revenue per field service engineer (direct labor) *	5,010	5,780	6,740	7,060
e) Direct expense per field service engineer (direct labor) *	5,760	5,760	6,080	6,000
f) Fully burdened expense per field service engineer (direct labor) *	5,610	6,180	6,490	6,370
g) Basic hourly rate charged for service	65	80	90	120
h) Fully burdened field service expense per field service employee (all categories) *	3,690	3,920	3,970	3,930

* PER MAN-MONTH

COMPANY D

EXPENSE LINE ITEM	PERCENT OF TOTAL EXPENSES [use ( ) to indicate credit] 1982	1983	1984
a) Basic direct labor, wages, salaries			
b) Direct labor overtime shift premiums and standby pay			
c) Support personnel salaries	54%	57%	59%
d) Management and administrative salaries and premiums			
e) Benefits programs			
f) Net parts usage	7	7	7
g) Inventory variances			
h) Depreciation	5	5	5
i) Travel (includes auto leases)	4	4	4
j) Relocation			
k) Education			
l) Equipment rental/lease			
m) Office, warehouse space	8	8	8
n) Communications	4	4	4
o) Interdivisional transfers			
p) Logistics, repair depot, and other expenses not reported above			
q) Corporate general and administrative allocation (overhead)	8	10	10
r) Other significant categories			
MISC.	10	5	3

FINANCIAL PERFORMANCE	FISCAL YEAR END _____ 1982	1983	1984	1987
a) Field service revenue ($ millions)	3	3	4	6
b) Field service expenses ($ millions)	2.8	2.8	3.8	5.7
c) Pretax profit (percent)	5%	5%	5%	5%
d) Revenue per field service engineer (direct labor)	60K	60K	80K	90K
e) Direct expense per field service engineer (direct labor)				
f) Fully burdened expense per field service engineer (direct labor)				
g) Basic hourly rate charged for service	6.5	68	68	75
h) Fully burdened field service expense per field service employee (all categories)				

COMPANY E

EXPENSE LINE ITEM	1982	1983
a) Basic direct labor, wages, salaries	30 %	30 %
b) Direct labor overtime shift premiums and standby pay	1 %	1 %
c) Support personnel salaries	ø	ø
d) Management and administrative salaries and premiums	10 %	9 %
e) Benefits programs	10 %	10 %
f) Net parts usage	33 %	33 %
g) Inventory variances	2 %	2 %
h) Depreciation	2 %	2 %
i) Travel (includes auto leases)	5 %	6 %
j) Relocation	ø	ø
k) Education	2 %	2 %
l) Equipment rental/lease	ø	ø
m) Office, warehouse space	5 %	5 %
n) Communications	ø	ø
o) Interdivisional transfers	ø	ø
p) Logistics, repair depot, and other expenses not reported above	ø	ø
q) Corporate general and administrative allocation (overhead)	ø	ø
r) Other significant categories		
_____	_____	_____
_____	_____	_____

COMPANY F

EXPENSE LINE ITEM	PERCENT OF TOTAL EXPENSES [use ( ) to indicate credit] 1983	1985
a) Direct labor	40	40
b) Management and administrative	10	10
c) Benefits	10	10
d) Parts	30	30
e) Depreciation	—	—
f) Travel	4	4
g) Education	4	4
h) Logistics, repair depot, and other expenses not reported above	—	—
i) Overhead	—	—
j) Other significant categories	—	—

FINANCIAL PERFORMANCE	FISCAL YEAR END _____ 1983	1985
a) Field service revenue ($ millions)	~~1.4~~ 1.7 MM	2.1 MM
b) Field service expenses ($ millions)	~~.7~~ 8.4 MM	1.0 MM
c) Pretax profit (percent)	50 %	50 %
d) Revenue per field service engineer (direct labor)	—	—
e) Direct expense per field service engineer (direct labor)	—	—
f) Fully burdened expense per field service engineer (direct labor)	—	—

COMPANY G

FINANCIAL PERFORMANCE	FISCAL YEAR END _____ 1983	1985
a) Field service revenue ($ millions)		
b) Field service expenses ($ millions)		
c) Pretax profit (percent)		
d) Revenue per field service engineer (direct labor)		
e) Direct expense per field service engineer (direct labor)		
f) Fully burdened expense per field service engineer (direct labor)		

1982

$ 11,181,000

12,457,000

-1

70,800

30,000

92400

EXPENSE LINE ITEM	PERCENT OF TOTAL EXPENSES (use ( ) to indicate credit) 1983	1985
a) Direct labor	25	22
b) Management and administrative	12	12
c) Benefits	9	8
d) Parts	—	—
e) Depreciation	4	3
f) Travel	10	8
g) Education	1	1
h) Logistics, repair depot, and other expenses not reported above	13	18
i) Overhead	6	6
j) Other significant categories		

COMPANY H

EXPENSE LINE ITEM	1982
a) Basic direct labor, wages, salaries	24%
b) Direct labor overtime shift premiums and standby pay	
c) Support personnel salaries	
d) Management and administrative salaries and premiums	
e) Benefits programs	
f) Net parts usage	21%
g) Inventory variances	
h) Depreciation	
i) Travel (includes auto leases) include labor	11%
j) Relocation	
k) Education	
l) Equipment rental/lease	
m) Office, warehouse space	
n) Communications	
o) Interdivisional transfers	
p) Logistics, repair depot, and other expenses not reported above	
q) Corporate general and administrative allocation (overhead)	
r) Other significant categories burden and overhead (includes other items not marked above)	44

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FINANCIAL PERFORMANCE	FISCAL YEAR END			
	1982	1983	1984	1987
a) Field service revenue ($ millions)	235	258	270	350
b) Field service expenses ($ millions)				
c) Pretax profit (percent)	10	10	10	10
d) Revenue per field service engineer (direct labor)	93K	102K		
e) Direct expense per field service engineer (direct labor)				
f) Fully burdened expense per field service engineer (direct labor)	129K	76K		
g) Basic hourly rate charged for service	80-132	83-152	+8%	+8%
h) Fully burdened field service expense per field service employee (all categories)				

COMPANY I

EXPENSE LINE ITEM	1982
a) Basic direct labor, wages, salaries	30
b) Direct labor overtime shift premiums and standby pay	4
c) Support personnel salaries	a,d,p
d) Management and administrative salaries and premiums	11
e) Benefits programs	9
f) Net parts usage	5
g) Inventory variances	—
h) Depreciation	6
i) Travel (includes auto leases)	7
j) Relocation	—
k) Education	a,c,d,p
l) Equipment rental/lease	.2
m) Office, warehouse space	3
n) Communications	2.5
o) Interdivisional transfers	—
p) Logistics, repair depot, and other expenses not reported above	12
q) Corporate general and administrative allocation (overhead)	10
r) Other significant categories	

FINANCIAL PERFORMANCE	1982
a) Field service revenue ($ millions)	122 mil
b) Field service expenses ($ millions)	91 mil
c) Pretax profit (percent)	25
d) Revenue per field service engineer (direct labor)	79K
e) Direct expense per field service engineer (direct labor)	30K
f) Fully burdened expense per field service engineer (direct labor)	59K
g) Basic hourly rate charged for service	82
h) Fully burdened field service expense per field service employee (all categories)	74